



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
CONCENTRATED ANIMAL FEEDING OPERATION
BEST MANAGEMENT PRACTICES
October 27, 2005

SECTION A - APPLICABILITY

1. These Best Management Practices (BMP) pertain to General Permits issued to concentrated animal feeding operations (CAFO) (MO-G010000) that collect process wastes for reuse as organic fertilizers and soil conditioners.
2. These BMPs are based on design regulations under 10 CSR 20-8.020; 40 CFR 412; guidelines under Manual 121, Design Guidelines For Animal Waste Management, July 1989, Missouri Department of Natural Resources; MWPS-18, Manure Management Systems Series, 2001, Midwest Plan Service; and Natural Resource Conservation Service standards. Exceptions to BMPs may be approved on a case-by-case basis by the department.

SECTION B - DEFINITIONS

Definitions as set forth in the Missouri Clean Water Law and 10 CSR 20-6.300 shall apply to those terms used herein. Other applicable definitions are as follows:

1. Agricultural Rates means not exceeding the agronomic rates for nitrogen or nitrogen fertilizer needs of the plants to be grown.
2. Biosolids are the solids or semi-solids (non-liquid) portion of animal wastes. This includes manure solids that are separated by physical means, or mixtures of manure and bedding materials (straw, wood chips, rice hulls, etc.) that absorb the liquids. Biosolids are considered process wastes.
3. Design Storm means the 25-year, 24-hour storm; the 10-year, 10-day storm, the 10-year, 365-day rainfall; and the 10-year, 365-day rainfall minus evaporation.
4. Land Application means the spreading, irrigating or other placement of process wastes onto agricultural land or forestland.
5. Land Application Management Approach means the conservative or plant available design approach for determining nitrogen application rates as follows:
 - (a) Conservative Management Approach means the annual application rate is based on applying 100 pounds per acre of total nitrogen. Total nitrogen is based on total nitrogen content of the wastes at the time of application.
 - (b) Plant Available Nitrogen Approach means the annual application rate is based on the available nitrogen uptake of the plants to be grown using testing of process wastes and soils to determine nitrogen requirements.
6. Safety Volume means the portion of the storage basin that is reserved for containment of the 25-year, 24-hour or the 10-year, 10-day storm events.
7. Storage Structure means all outside storage structures containing liquid wastes such as lagoons, earthen manure basins, concrete manure pits, storage tanks, and other such storage structures.

SECTION C - GENERAL REQUIREMENTS

1. No-Discharge Requirements

Process wastes shall be removed from the operation on a routine schedule based on the design capacity of the storage structure(s) and shall be land applied at agricultural rates.

2. Beneficial Use Requirements

The operation is required to recycle or reuse process wastes as fertilizer onto agricultural land or forestland.

3. Operating Plan

Follow the operating plans contained in the permit application.

4. Dead Animal Disposal

Dead animal disposal shall be conducted in compliance with the dead animal disposal regulations of the Missouri Department of Agriculture.

5. Storage Structures

- (a) The approved storage structures are listed in the Detailed Operation Description and in the permit application. No other outside storage of process wastes is allowed except for "temporary stockpiles" of biosolids.
- (b) Temporary stockpiles of biosolids may be stored for up to two weeks during land application periods. All stockpiles shall be located at least 300 feet from drainage ways. Proper runoff controls shall be provided.

SECTION D - LAND APPLICATION REQUIREMENTS

1. Nutrient Limitations

- (a) The minimum acres required for spreading of process wastes are specified in the Nutrient Management Plan.
- (b) Nitrogen application rates shall be based on a "Conservative" or "Plant Available" management approach as specified in the permit application.
- (c) Supplemental fertilizer should be applied as necessary to balance nutrient needs of the vegetation grown.
- (d) Phosphorus application rate shall be in accordance with rules under 10 CSR 20-6.300 and as contained in the approved nutrient management plan.

2. Setback Distances

Setback distances shall be maintained between the land application site and other features as follows:

- (a) 300 feet from losing streams, sinkholes, caves, wells, abandoned wells, water supply structures or impoundments and any other connection between surface and ground water;
- (b) 150 feet from dwellings or public use areas if applied with spray irrigation systems
- (c) 100 feet from permanent flowing streams, intermittent flowing streams, privately owned impoundments not used as a water supply and surface waters down gradient to land application;
- (d) 50 feet for application by tank wagon or solid spreader from dwellings or public use areas; and
- (e) 50 feet from property lines

3. Slope Limitations

- (a) Process wastes shall not be applied on land having a slope greater than ten percent (10%) unless prior approval is obtained from the department.
- (b) The hourly application rate shall not exceed one-half (1/2) the design sustained permeability for slopes exceeding ten percent (10%).
- (c) The maximum allowable slope is twenty percent (20%).

4. Land Application Rate Limitations

- (a) Land application should be planned when the soil conditions are dry enough to allow normal agricultural tillage operations.
- (b) Wastewater applications shall be carried out when soil moisture conditions are suitable to allow all wastewater to infiltrate into the soil.
- (c) Application rates shall be adjusted for soil moisture and slope conditions so that there is no runoff of applied wastewater or solids.
- (d) Process wastes shall not be land applied when soils are frozen or saturated.

5. Operation of Land Application Equipment

- (a) Process wastes shall be applied uniformly over the number of acres suitable for land application as specified in the permit application.
- (b) Land application equipment for spreading solids or wastewater shall be monitored such that any malfunctions in the operation of the equipment are detected and corrected before any over application of waste occurs to the spreading site.

6. Spray Irrigation Equipment

- (a) Spray Irrigation Systems (traveling gun, center pivot, fixed spray nozzles, etc.) should have automatic shut-off devices in the case of pressure loss.
- (b) Spray irrigation systems that do not have automatic shut-off systems to detect pressure loss or mechanical breakdowns shall have an operator on-site at all times during operation to monitor for proper operation.
- (c) Personnel operating and monitoring the irrigation equipment shall be trained in proper wastewater irrigation techniques by either the University of Missouri Extension Service, U.S.D.A. Natural Resource Conservation Service, Manufacturer's representative, custom wastewater application company representative, or a professional engineer.
- (d) Operators shall check the perimeter of application fields during land application to ensure that applied wastewater does not run off from the fields where applied and does not enter waters of the state.

SECTION E – OPERATION OF UNCOVERED LIQUID STORAGE STRUCTURES

1. Minimum Operating Level

- (a) The liquid level in the storage structure shall be maintained between the minimum and maximum operating levels, as necessary, so that adequate storage capacity is available for use during adverse weather periods when conditions are not suitable for proper land application.
- (b) The liquid level in the storage structure should be lowered to the minimum operating level on a routine schedule based on the design storage period and operating plan as listed in the Detailed Operation Description. This should be accomplished prior to expected frost periods and seasonal wet periods.

2. Maximum Operating Level

- (a) The maximum operating level for uncovered storage structures is one foot below the emergency overflow level unless specified otherwise in the Detailed Operation Description.
- (b) The operation shall be managed so that the level of liquids in the storage structure does not exceed the maximum operating level except when a 25-year, 24- hour storm or a 10-year, 10-day storm occurs.

3. Safety Volume

- (a) When a design storm event occurs, the "safety volume" shall be used to contain up to the 25-year, 24-hour storm or the 10-year, 10-day storm until conditions are suitable for land application.
- (b) The excess rainfall above the design storm events may be allowed to overflow through the emergency spillway when land application is not feasible.
- (c) The safety volume shall fit between the overflow level and the maximum operating level.

4. Storage Volume

- (a) The "storage volume" shall be the volume used to contain process wastes including the average rainfall for the design storage period.
- (b) The storage volume shall fit between the minimum operating level and the maximum operating level.